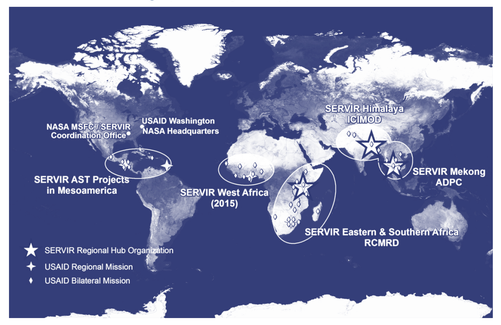
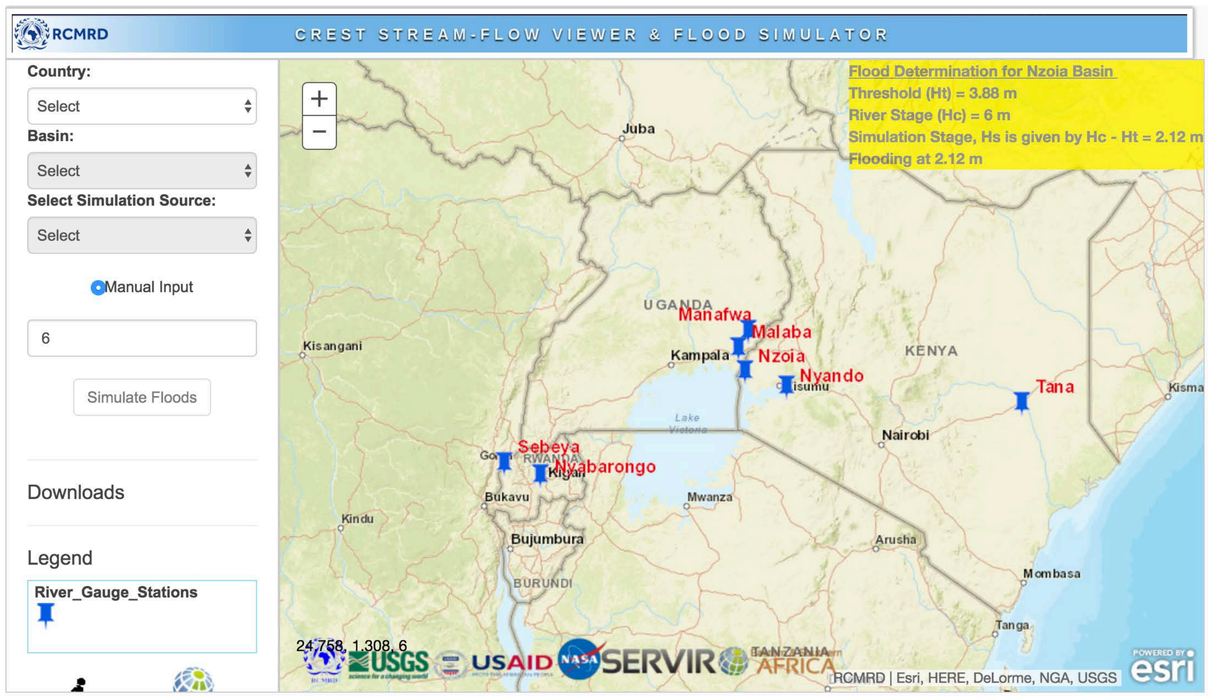
Surface Water and Flood Extent Mapping, Monitoring, and Modeling products and services for the SERVIR regions



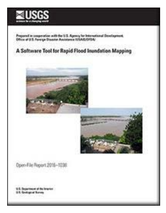
Eric Anderson, University of Alabama in Huntsville / SERVIR Science Coordination Office at NASA/Marshall Space Flight Center, Huntsville, AL

SERVIR is a joint NASA - US Agency for International Development (USAID) project to improve environmental decision-making using Earth observations and geospatial technologies. A common need identified among SERVIR regions has been improved information for disaster risk reduction and in specific surface water and flood extent mapping, monitoring and forecasting. Of the 70 SERVIR products (active, complete, and in development), 4 are related to surface water and flood extent mapping, monitoring or forecasting. Visit http://www.servircatalog.net for more product details.

Flood Simulator for African Basins
RCMRD/SERVIR-Eastern & Southern Africa with FEWS NET



This application combines the CREST hydrologic model with digital elevation maps and sends users an email alert with real-time and short-term forecast flood inundation maps of select stream-gauge locations. An web map version of the flood simulator is above.



http://cloud.rcmrd.org/floodsimulator/

Verdin et al., 2016, https://pubs.er.usgs.gov/publication/ofr20161038

Multi-Scale Disaster Risk Assessment and Decision Support System for DRR
ICIMOD/SERVIR-Himalaya

Flood simulations for Rapti river, Nepal, under different rainfall accumulations (100 to 420 mm) and return periods (2-100 yr), support planning and risk reduction.

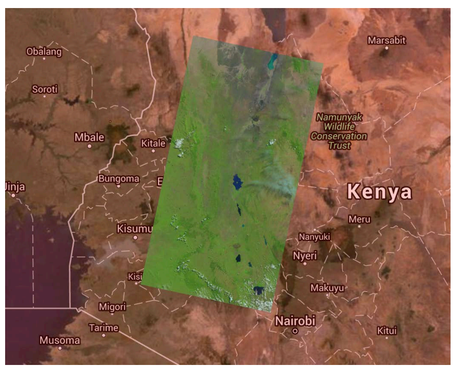
http://apps.geoportal.icimod.org/raptiflood

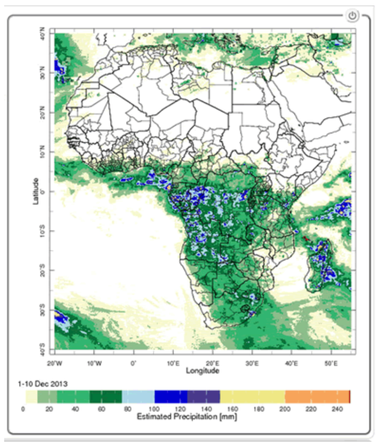
http://www.icimod.org/?q=21316

"The biggest problem we have is lack of data. When someone like SERVIR-Eastern and Southern Africa comes along to help us out, it is very good because we have been missing [advance warning of] floods."
Simintei Kooke, Deputy Director, Kenya Department of Water Resources

Flood and Climate Information for Management of Disasters and Mosquito-Borne Disease
SERVIR Applied Sciences Team Project, Ceccato et al.

This project forecasts flood likelihoods and assesses vector-borne disease risk for SERVIR-Eastern and Southern Africa in support of infectious disease monitoring and outbreak prediction.



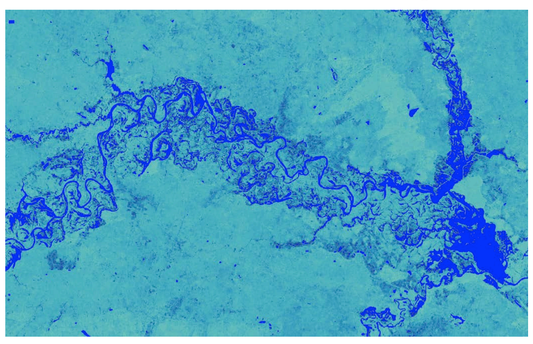


Co-I Erika Podest (JPL) trains RCMRD staff and 16 participants from the Ministry of Water and Irrigation of Kenya, Kenya Water Institute, and the Ministry of Mining's Department of Resource Surveys and Remote Sensing, in methods to automate the detection of surface water extent and color using Landsat images.

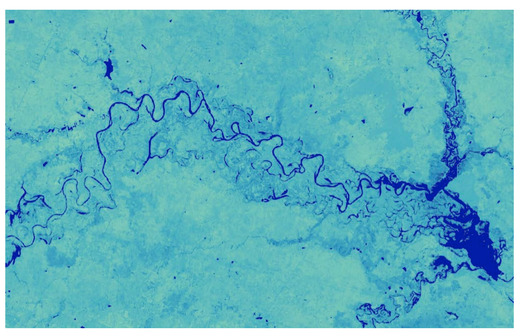
Surface Water Extent Mapping Tool For the Lower Mekong
SERVIR-Mekong: ADPC / Deltares / SEI / SIG

This satellite-based water resources and water hazard mapping system produces a series of historical flood extent maps for the years 2000 to 2015 for the most extensive flooding in the Lower Mekong Basin during monsoon seasons to help end users visualize and understand the inter-annual variability of inundated areas. Landsat and SRTM are primary inputs into processing run on Google Earth Engine.

Thailand example: Modified Normalized Difference Index



(8th percentile) over the Landsat 8 period. This normally represents flood water.



(40th percentile) over the Landsat 8 period. This normally represents permanent water

(from Schellekens, Donchyts, Jayasinghe, Phongsapan, Apirumanekul, Pudashine, and Saah).

http://servircatalog.net/Product?product_id=152

http://www.asce.org/magazine/20160105-global-satellite-coverage-improves-flood-mapping/

Donchyts, G., et al., 2015. Quality assessment of OpenStreetMap water mask using LANDSAT 8 imagery and Google Earth Engine. Geophysical Research Abstracts, 17, EGU General Assembly, Vienna, Austria, 12-17 April 2015.

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